IN THE CLAIMS:

1. (Original) A method of reducing computational resources in characterizing a parameter for a combination of an input pin and an output pin of a cell, said cell being contained in a library used in the design of an integrated circuit, said method comprises:

determining a worst case vector, wherein said worst case vector represents a set of input bits, with each of said input bits being applied to a corresponding one of a set of input pins other than said input pin of said combination, wherein said worst case vector would cause propagation of most noise from said input pin to said output pin among vectors which would cause a bit value transition on said output pin if the input bit value is changed on said input pin; and

computing a plurality of data values for said parameter when said worst case vector is applied to said set of input pins,

wherein said plurality of data values are used in an analysis of said integrated circuit irrespective of which of said vectors is applied to said set of input pins.

2. (Original) The method of claim 1, wherein said determining comprises:

applying a plurality of glitches to said cell for each of said vectors; and

examining an output glitch corresponding to each of said plurality of glitches on said output pin to determine said worst case vector.

3. (Original) The method of claim 2, wherein all of said plurality of glitches have the same width and each of said plurality of input glitches has a different height, and

wherein said examining examines a height corresponding to each of said output glitches on said output pin.

4. (Original) The method of claim 3, wherein said applying and said examining determine at least three immunity transition points for each of said vectors, wherein each of said immunity transition points indicates a minimum height of said plurality of glitches at which the height of said output glitch exceeds a first threshold, said method comprises:

plotting a curve corresponding to each of said vectors based on said at least three immunity transition points, wherein a vector corresponding to the curve with the least heights is determined to be said worst case vector.

5. (Original) The method of claim 4, wherein more than one curve contains at least one point with said least height for a corresponding width, wherein each vector corresponding to said more than one curve is treated as said worst case vector in said analysis of said integrated circuit.

6. (Original) The method of claim 1, wherein said parameter comprises noise immunity, wherein a failure result is deemed to be obtained for an input glitch of a first height and a first width if the height of an output glitch corresponding to said input glitch exceeds a first threshold voltage, and a success result is deemed to be obtained otherwise, said method further comprises generating a noise immunity curve (NIC) corresponding to only said worst case vector, wherein said NIC contains a plurality of immunity transition points, wherein each of said plurality of immunity transition points indicates a minimum value for one dimension of said input glitch required for said failure result for each of a value of the other dimension.

7. (Original) The method of claim 6, wherein said one dimension comprises height and said other dimension comprises width.

8. (Original) The method of claim 6, wherein said parameter also comprises noise propagation (NP), said method further comprising generating a NP curve corresponding to each width of interest, wherein said NP curve indicates a height of an output glitch in response to an input glitch of a given height, wherein said NP curves are also generated only for said worst case vector.

9. (Original) The method of claim 8, wherein data representing said NP curves are used to generate said NIC and said NIC is used to generate said NP curves.

10. (Original) The method of claim 8, wherein each of said plurality of immunity transition points is determined by a search in a search range, wherein said search range is less than a maximum height possible for said height of said input glitch.

11. (Original) The method of claim 10, further comprising:

plotting said NIC based on a plurality of computed immunity transition points;

predicting a potential immunity transition point for a width of an immunity transition point sought to be computed by using said NIC; and

setting said search range based on a value of height of said potential immunity transition point.

12. (Original) The method of claim 10, further comprises:

determining a first NP curve corresponding to a width of a first immunity transition point sought to be determined on said NIC;

setting an upper bound and a lower bound of said search range according to said first NP curve.

13. (Original) The method of claim 12, wherein said setting finds a first point on said first NP curve with a height of the input glitch exceeding the height of said first immunity transition point, and a second point on said NP curve with a height of the input glitch less than the height of said first immunity transition point, wherein said upper bound and said lower bound of said search range are respectively set equal to the height of the input glitches corresponding to said first point and said second point.

14. (Original) The method of claim 10, further comprising:

setting an upper bound of said search range to the height of a fourth point on said NIC and the lower bound of said search range to the height of a fifth point on said NIC, wherein said fourth point and said fifth point correspond to immunity transition points already determined, said fifth point having a height less than the height of a first immunity transition point sought to be determined on said NIC, said fourth point having a height more than the height of a first immunity transition point sought to be determined on said NIC.

15. (Original) The method of claim 8, further comprising:

determining a transition region of a first NP curve sought to be plotted for said cell;

determining a first input glitch height corresponding to one boundary of said transition region on said first NP curve and a second input glitch height corresponding to another boundary of said transition region wherein said second input glitch height is greater than said first input glitch height;

setting the output glitch height corresponding to each point on said first NP curve with an input glitch height greater than the input glitch height of said second input glitch height to equal the output glitch height of said second input glitch height; and

setting the output glitch height corresponding to each point on said first NP curve with an input glitch height less than the input glitch height of said first input glitch height to equal the output glitch height of said first input glitch height.

16. (Original) The method of claim 15, wherein said determining said transition region comprises:

predicting a start point according to the width for which said NP curve is being plotted, wherein said predicting maps the width of said NP curve to a first point on said NIC, wherein said start point is set based on the input glitch height of said first point on said NIC.

17. (Original) The method of claim 16, wherein a first start NP curve and a second start NP curve are determined before other NP curves, wherein said first start NP curve corresponds to the narrowest width and said second start NP curve corresponds to the widest width, said method further comprising:

setting said start point for said first start NP curve to equal a first start value and said start point for said second NP curve to a second start value, wherein said first start value is greater than said second start value.

18. (Original) The method of claim 17, wherein said first start value is closer to a maximum possible height of the input glitch and said second start value is closer to a minimum possible height of the input glitch.

19. (Original) The method of claim 1, wherein said cell comprises a sequential element, said method further comprising:

applying an input transition waveform having a height equaling the height of an input glitch of interest, said input transition waveform being associated with reference to a clock signal to provide infinite setup and hold times for said sequential element to latch said input transition waveform;

examining the output signal generated by said sequential element to determine whether sufficient noise was propagated by said sequential element; and

determining that sweep can be avoided for all widths of the input glitches of said height if sufficient noise is not propagated by said sequential element.

20. (Original) The method of claim 19, wherein said sufficient noise is deemed to be propagated if said output signal generated by said sequential element changes from one logical value to the other or if the height of an output glitch in said output signal exceeds a pre_specified threshold voltage.

21-44. (Canceled)

45. (Original) A machine readable medium carrying one or more sequences of instructions for causing a system to reduce computational resources in characterizing a parameter for a combination of an input pin and an output pin of a cell, said cell being contained in a library used in the design of an integrated circuit, wherein execution of said one or more sequences of instructions by one or more processors contained in said system causes said one or more processors to perform the actions of:

determining a worst case vector, wherein said worst case vector represents a set of input bits, with each of said input bits being applied to a corresponding one of a set of input pins other than said input pin of said combination, wherein said worst case vector would cause propagation of most noise from said input pin to said output pin among vectors which would cause a bit value transition on said output pin if the input bit value is changed on said input pin; and

computing a plurality of data values for said parameter when said worst case vector is applied to said set of input pins,

wherein said plurality of data values are used in an analysis of said integrated circuit irrespective of which of said vectors is applied to said set of input pins.

46. (Original) The machine readable medium of claim 45, wherein said determining comprises:

applying a plurality of glitches to said cell for each of said vectors; and

examining an output glitch corresponding to each of said plurality of glitches on said output pin to determine said worst case vector.

47. (Original) The machine readable medium of claim 46, wherein all of said plurality of glitches have the same width and each of said plurality of input glitches has a different height, and wherein said examining examines a height corresponding to each of said output glitches on said output pin.

48. (Original) The machine readable medium of claim 47, wherein said applying and said examining determine at least three immunity transition points for each of said vectors, wherein each of said immunity transition points indicates a minimum height of said plurality of glitches at which the height of said output glitch exceeds a first threshold, said method comprises:

plotting a curve corresponding to each of said vectors based on said at least three immunity transition points, wherein a vector corresponding to the curve with the least heights is determined to be said worst case vector.

49. (Original) The machine readable medium of claim 48, wherein more than one curve contains at least one point with said least height for a corresponding width, wherein each vector corresponding to said more than one curve is treated as said worst case vector in said analysis of said integrated circuit.

50. (Original) The machine readable medium of claim 45, wherein said parameter comprises noise immunity, wherein a failure result is deemed to be obtained for an input glitch of a first height and a first width if the height of an output glitch corresponding to said input glitch exceeds a first threshold voltage, and a success result is deemed to be obtained otherwise, said method further comprises generating a noise immunity curve (NIC) corresponding to only said worst case vector, wherein said NIC contains a plurality of immunity transition points, wherein each of said plurality of immunity

transition points indicates a minimum value for one dimension of said input glitch required for said failure result for each of a value of the other dimension.

51. (Original) The machine readable medium of claim 50, wherein said one dimension comprises height and said other dimension comprises width.

52. (Original) The machine readable medium of claim 51, wherein said parameter also comprises noise propagation (NP), said method further comprising generating a NP curve corresponding to each width of interest, wherein said NP curve indicates a height of an output glitch in response to an input glitch of a given height, wherein said NP curves are also generated only for said worst case vector.

53. (Original) The machine readable medium of claim 52, wherein data representing said NP curves are used to generate said NIC and said NIC is used to generate said NP curves.

54. (Original) The machine readable medium of claim 52, wherein each of said plurality of immunity transition points is determined by a search in a search range, wherein said search range is less than a maximum height possible for said height of said input glitch.

55. (Original) The machine readable medium of claim 54, further comprising:

plotting said NIC based on a plurality of computed immunity transition points;

predicting a potential immunity transition point for a width of an immunity transition point sought to be computed by using said NIC; and

setting said search range based on a value of height of said potential immunity transition point.

56. (Original) The machine readable medium of claim 54, further comprises:

determining a first NP curve corresponding to a width of a first immunity transition point sought to be determined on said NIC;

setting an upper bound and a lower bound of said search range according to said first NP curve.

57. (Original) The machine readable medium of claim 56, wherein said setting finds a first point on said first NP curve with a height of the input glitch exceeding the height of said first immunity transition point, and a second point on said NP curve with a height of the input glitch less than the height of said first immunity transition point, wherein said upper bound and said lower bound of said search range are respectively set equal to the height of the input glitches corresponding to said first point and said second point.

58. (Original) The machine readable medium of claim 54, further comprising:

setting an upper bound of said search range to the height of a fourth point on said NIC and the lower bound of said search range to the height of a fifth point on said NIC, wherein said fourth point and said fifth point correspond to immunity transition points already determined, said fifth point having a height less than the height of a first immunity transition point sought to be determined on said NIC, said fourth point having a height more than the height of a first immunity transition point sought to be determined on said NIC.

59. (Original) The machine readable medium of claim 52, further comprising:

determining a transition region of a first NP curve sought to be plotted for said cell;

determining a first input glitch height corresponding to one boundary of said transition region on said first NP curve and a second input glitch height corresponding to another boundary of said transition region wherein said second input glitch height is greater than said first input glitch height;

setting the output glitch height corresponding to each point on said first NP curve with an input glitch height greater than the input glitch height of said second input glitch height to equal the output glitch height of said second input glitch height; and

setting the output glitch height corresponding to each point on said first NP curve with an input glitch height less than the input glitch height of said first input glitch height to equal the output glitch height of said first input glitch height.

60. (Original) The machine readable medium of claim 59, wherein said determining said transition region comprises:

predicting a start point according to the width for which said NP curve is being plotted, wherein said predicting maps the width of said NP curve to a first point on said NIC, wherein said start point is set based on the input glitch height of said first point on said NIC.

61. (Original) The machine readable medium of claim 60, wherein a first start NP curve and a second start NP curve are determined before other NP curves, wherein said first

start NP curve corresponds to the narrowest width and said second start NP curve corresponds to the widest width, further comprising:

setting said start point for said first start NP curve to equal a first start value and said start point for said second NP curve to a second start value, wherein said first start value is greater than said second start value.

62. (Original) The machine readable medium of claim 61, wherein said first start value is closer to a maximum possible height of the input glitch and said second start value is closer to a minimum possible height of the input glitch.

63. (Original) The machine readable medium of claim 45, wherein said cell comprises a sequential element, further comprising:

applying an input transition waveform having a height equaling the height of an input glitch of interest, said input transition waveform being associated with reference to a clock signal to provide infinite setup and hold times for said sequential element to latch said input transition waveform;

examining the output signal generated by said sequential element to determine whether sufficient noise was propagated by said sequential element; and

determining that sweep can be avoided for all widths of the input glitches of said height if sufficient noise is not propagated by said sequential element.

64. (Original) The machine readable medium of claim 63, wherein sufficient noise is deemed to be propagated if said output signal generated by said sequential element

changes from one logical value to the other or if the height of an output glitch in said output signal exceeds a pre-specified threshold.

65-88. (Canceled)